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Assistant Commissioner for Patents
Washington, D.C. 20231

On Nov. 29, 2001

TOWNSEND and TOWNSEND and CREW LLP

By: *Stephen J. Karlik*

PATENT
Attorney Docket No.: 15270-004300US
Client Reference No.: 00188-US-NEW

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

S. A. Rubin et al.

Application No.: 09/010,377

Filed: January 21, 1998

For: TREATMENT OF VIRAL
ENCEPHALITIS BY AGENTS
BLOCKING ALPHA-VLA-4
INTEGRIN FUNCTION

Examiner: Philip Gambel

Art Unit: 1644

DECLARATION OF STEPHEN J.
KARLIK

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

I, Stephen J. Karlik, state as follows:

1. I, Stephen J. Karlik, am a Professor, University of Western Ontario, London, Ontario, Canada, and am an expert in the field of animal models for multiple sclerosis and other inflammatory disorders.

2. I have reviewed the relevant portion of the subject patent application and the Office Action dated July 31, 2000. The application has claims directed to methods of treating viral encephalitis in a patient free of multiple sclerosis using an agent that inhibits binding of leukocytes to brain endothelial cells via leukocyte surface antigen alpha-4 integrin. I

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understand that the Examiner has cited the following references in rejecting the claimed invention as allegedly being obvious: Bendig et al. (U.S. Patent No. 5,840,299), Soilu-Hanninen et al. (Scand. J. Immunol. 43: 727, 1996), and Soilu-Hanninen 1997 (J. Neuroimmunol. 72:95-105, 1997). I understand the Examiner has asserted that the models described in the cited references would have been predictive of the success of the presently claimed methods, and that the present claims are thus obvious in view of the cited references. Applicants have argued that these models would not have been predictive of the success of anti-VLA4 agents in treating viral encephalitis, as the animal models described in the cited references would not have been sufficiently predictive for the treatment of viral encephalitis in the absence of multiple sclerosis. My opinion is that the animal models discussed in the cited references are not predictive of the efficacy of anti-VLA4 agents in viral encephalitis in the absence of multiple sclerosis, that the animal model described in the present application specification is different from the models described in the cited references, and that the animal model of the application is predictive that agents to VLA-4 are useful in treating simple viral encephalitis. My opinion is based on the following facts.

3. The animal models discussed in the cited references show that antibodies to alpha-4 integrin are effective in inhibiting inflammation due to EAE, which is a syndrome simulating multiple sclerosis. However, multiple sclerosis is an autoimmune disease, and the inflammation present in EAE models results primarily, if not exclusively, from nonviral sources. For example, in Soilu-Hanninen's mice, EAE is induced by body irradiation and subsequent immunization with spinal cord homogenate; viral infection serves merely to augment the inflammatory response due to other factors. The avirulent Semliki virus alone does not induce encephalitis. The beneficial results from treatment with antibodies to alpha-4 integrin in Soilu-Hanninen's model may have been entirely or principally due to inhibition of inflammation resulting from the radiation and injection of brain homogenate rather than inhibition of inflammation resulting from viral infection. In the EAE model of Bendig et al., inflammation was due solely to irradiation and subsequent immunization, and thus the viral inflammation could not have been addressed in this model. Therefore, results from EAE models do not directly address the

ability of antibodies to alpha-4 integrin to treat inflammation that is due exclusively to viral infection.

4. Inflammation that is solely due to viral infection presents great uncertainties for immunosuppressive treatment because of the complex role of inflammation clearing the virus and the resulting damage to surrounding tissues caused by such clearance. The combination of the beneficial and harmful consequences of viral infection-induced inflammation create uncertainty in the predictability of the immunosuppressive agents that would be useful in inhibiting such inflammation. For example, if treatment with an immunosuppressive agent increased the extent of viral infection as a result of decreased immune surveillance, the agent could effectively cause an increase in the damage to the subject. In fact, many immunosuppressive drugs currently prescribed by physicians have a warning label stating that immune suppression could increase susceptibility to infection.
5. The present application differs from the cited references in describing results from a model in which inflammation is solely the result of viral infection. Treatment with $\alpha 4$ integrin antibody was effective in preventing or ameliorating immune-mediated CNS damage following viral encephalitis in rats (see, e.g., pages 23-27). The effects included a reduction in prevalence and severity of clinical Borna disease, a reduction in body weight loss, and a reduction in the severity of encephalitis. Despite blocking the immunopathological immune response to viral encephalitis, the treatment did not cause enhanced viral replication (see, e.g., pages 27-28). These results indicate that treatment with antibodies to alpha-4 integrin is effective in suppressing the harmful effects of virally-induced inflammation without significantly suppressing the beneficial effects that keep viral replication in check.
6. In my opinion, this differential effect in suppressing harmful effects of inflammation without impairing beneficial effects resulting from treatment of simple viral infection with agents to alpha-4 integrin was not reasonably predictable from the animal models discussed in the references cited by the Examiner.

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7. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date Nov 19, 2001

By



Stephen J. Karlik, Ph.D.

Attachments: curriculum vitae
PA 3162994 v2

Stephen James Karlik
Department of Diagnostic Radiology, 2MR21
London Health Sciences Centre
University Campus
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London, Ontario, N6A 5A5
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EDUCATION:

- 1969 Senior Matriculation, Assumption College School, Windsor
- 1972 BSc (Chemistry) McGill University, Montreal
- 1979 PhD (Physiology) University of Toronto, Toronto
 Thesis Title: Aluminum Interactions with DNA and other Polynucleotides
 Supervisor: Dr. Donald R. Crapper-McLachlan

POST DOCTORAL:

- 1979-1983 Visiting Associate, Laboratory of Cellular and Molecular Biology, National Institutes of Health, National Institute on Aging - Director: Dr. G.L. Eichhorn

ACADEMIC / EMPLOYMENT HISTORY:

PRIMARY APPOINTMENTS:

- 1983-1988 Assistant Professor, Department of Diagnostic Radiology and Nuclear Medicine, University of Western Ontario, London, Ontario
- 1988-1996 Associate Professor, Department of Diagnostic Radiology and Nuclear Medicine, University of Western Ontario, London, Ontario
- 1996-Present Professor, Department of Diagnostic Radiology and Nuclear Medicine, University of Western Ontario, London, Ontario

CROSS APPOINTMENTS:

- 1983-1989 Assistant Professor, Department of Clinical Neurological Sciences, University of Western Ontario, London, Ontario
- 1987-Present Scientist, Imaging Research Laboratory, Robarts Research Institute, London, Ontario
- 1988-1996 Associate Professor, Department of Physiology, University of Western Ontario, London, Ontario
- 1988-Present Honorary Lecturer, Department of Medical Biophysics, University of Western Ontario
- 1989-1996 Associate Professor, Department of Clinical Neurological Sciences, University of Western Ontario, London, Ontario
- 1996-Present Professor, Department of Clinical Neurological Sciences, University of Western Ontario, London, Ontario
- 1996-Present Professor, Department of Physiology, University of Western Ontario, London, Ontario
- 1996-Present Honorary Lecturer, Department of Pathology, University of Western Ontario, London, Ontario

CONTINUING EDUCATION:**CONFERENCE AND PROFESSIONAL ANNUAL MEETING ATTENDANCE:**

- 1977 Clinical Research Society of Toronto, Toronto
Canadian Congress of Neurological Sciences
- 1979 Canadian Congress of Neurological Sciences
XIth Internal Union of Biochemistry, Toronto
American Chemical Society
Gerontological Society
- 1981 American Society of Biological Chemistry
Federation of American Society of Biological Chemists
- 1982 Canadian Chemical Congress
American Chemical Society
- 1983 International Society of Magnetic Resonance
Aluminum Analysis in Biological Materials
- 1984 Society of Magnetic Resonance in Medicine, New York
American College of Neurology
- 1985 Canadian Association of Radiologists
Radiological Society of North America
Society for Magnetic Resonance Imaging
- 1986 Canadian Congress of Neurological Sciences
XII Symposium Neuroradiologicum
Radiological Society of North America
Metals, Aging and Alzheimer's Disease
- 1987 Canadian Association of Radiologists
American Association of Physicists in Medicine
Society of Magnetic Resonance in Medicine
VI International Congress of Immunology
- 1988 Society of Magnetic Resonance in Medicine
Society of Magnetic Resonance Imaging
- 1989 Society for Magnetic Resonance in Medicine
American Society for Neuroradiology
Society for Magnetic Resonance Imaging
American Academy of Neurology
- 1990 XIV Symposium Neuroradiologicum
76th Radiological Society of North America
Society for Magnetic Resonance in Medicine
- 1991 Society of Magnetic Resonance in Medicine
- 1992 Society of Magnetic Resonance in Medicine
Canadian Association of Radiologists
78th Radiological Society of North America

- 1993 XVII Canadian Congress of Neurological Sciences
Society of Magnetic Resonance in Medicine
79th Radiological Society of North America
Canadian Association of Radiologists
- 1994 IBC Cell Adhesion Meeting
Canadian Association of Radiologists
80th Radiological Society of North America
Society of Magnetic Resonance in Medicine
- 1995 Multiple Sclerosis Load Evaluation Workshop
Society for Neuroscience
Canadian Congress of Neurological Sciences
Canadian Heads of Academic Radiology
- 1996 Asian Pacific Congress on Vascular Disease
IBC Cell Adhesion Molecules and Matrix Proteins
Radiological Society of North America
America's Committee for Treatment and Research in Multiple Sclerosis
Society for Experimental Neuropathology
American Neurological Association
Canadian Heads of Academic Radiology
- 1997 IBC Cell Adhesion Molecules
American Academy of Neurology
- 1998 International Society for Magnetic Resonance in Medicine
American Neurological Association
International Society of Neuroimmunology
Biology of Neurologic Disease Meeting
Society for Health Services Research in Radiology
Canadian Heads of Academic Radiology
Radiological Society of North America
- 1999 Canadian Heads of Academic Radiology
European Society of Neuroradiology
ECTRIMS/ACTRIMS
- 2000 ECTRIMS
RSNA
- 2001 ECTRIMS
ISMRM White Matter Study Group

FACULTY DEVELOPMENT:

- 1995 Conflict Resolution and Confrontation Skills
1996 Organizational Skills Workshop

HONOURS AND OTHER SPECIAL SCIENTIFIC RECOGNITION:

- 1978-1979 Studentship, Ontario Mental Health Foundation
1979-1982 Fogarty Fellowship, National Institutes of Health

1992-1994 Career Scientist, Sterling Winthrop Imaging Research Institute

SCHOLARLY AND PROFESSIONAL ACTIVITIES:

SOCIETY MEMBERSHIPS:

International Society of Magnetic Resonance in Medicine - ISMRM
 American Society of Neuroradiology - ASNR
 Radiological Society of North American - RSNA
 Canadian Association of Radiologists - CAR
 Society for Neuroscience
 Society for Experimental Neuropathology
 Society for Health Services Research in Radiology

NATIONAL SOCIETY EXECUTIVE:

Secretary, 1993 -1998, Radiology Resident's Research Directors, CAR, CHAR
 Chairman, 1998-2000, Radiology Resident's Research Directors, CAR, CHAR

EDITORSHIP:

ACR - CAR Program in Fundamentals of Clinical Research for Radiologists (22 part series and web site)

ROLES ON REVIEW BOARDS OF JOURNALS AND GRANTING AGENCIES:

1. Ad Hoc Reviewer:

<u>Journal</u>	<u>Year(s)</u>
Pharmacology	1985
Inorganic Chemicals Acta	1985
Stroke	1985-present
Life Sciences	1987
Medical Physics	1987-present
Magnetic Resonance in Medicine	1989-present
Canadian Journal of Neurological Sciences	1990-present
Annals of Neurology	1990-present
Journal of Magnetic Resonance Imaging	1991-present
Canadian Veterinary Journal	1992-present
Radiology	1997-present

Granting Agency

Medical Research Council of Canada	1985-present
Amyotrophic Lateral Sclerosis Society	1986
Gerontology Research Society of Ontario	1985
Ontario Mental Health Foundation	1987-present
Multiple Sclerosis Society of Canada	1989-present
Ottawa General Hospital Research Fund	1989
Winnipeg Health Sciences Center Research Foundation	1990-present
Sterling-Winthrop Imaging Research Institute	1992-93
Physicians Services Incorporated	1987-present

Fonds de la Recherche du Quebec
Australian Research Council

1993-present
1995-present

2. Member of Study Section

Study Section

Upjohn London Neurosciences Program

Year(s)
1989-91

National Institutes of Health -
National Institutes of Dental Research -
Research Centres in Oral Biology Special Review Committee

1991-1992
1999

Medical Research Council -
Pharmaceutical Manufacturers Association of Canada -
University Industry

1993-present

Ontario Graduate Scholarships

1997-98

Multiple Sclerosis Society of Canada

2000-present

VISITING PROFESSORSHIPS:

- 1) Grantmanship Workshop, McMaster University, 1991.
- 2) Grantmanship Workshop, University of Montreal, 1991.
- 3) Neurology, University of Auckland, New Zealand, 1996.
- 4) Radiology, Queen's University, 2000.

SERVICE TO THE COMMUNITY:

Secretary/Treasurer, St. Mary's Home Support Services 1992 - 1998.

COMMITTEE MEMBERSHIPS:

DEPARTMENT:

- 1) 1993 - Present Resident Research Coordinator, Diagnostic Radiology and Nuclear Medicine, UWO.
- 2) 1993 - Present Residency Training Committee, Diagnostic Radiology and Nuclear Medicine, UWO
- 3) 1988 - Present Radiology Residents Research Director

HOSPITAL:

1. University Hospital: MRI Planning and Building Committee 1985-86.
2. University Hospital: MRI Phase II Planning and Building 1990-91.
3. University Hospital: Chairman, fMRI Planning Committee 1994-95.
4. London Health Sciences, University Campus: Chairman, MRI Upgrade Committee 1997-98.
5. London Health Sciences: Executive, Scholars Forum 1996-1998.

GRADUATE STUDENT AND RESEARCH TRAINEE SUPERVISION:**Student Supervision**

1.	Tom Stavraky	Msc	Physiology	1992	<i>"Permeability Studies on the Blood-Brain Barrier"</i>
2.	Sharon Hyduk	PhD	Physiology	1997	<i>"$\alpha 4$ Integrin in Central Nervous System Inflammation"</i> Recipient of MS Studentship
3.	Judy Karpecki	Msc	Physiology	1999	<i>"Role of Metals in Integrin Adhesion"</i>
4.	Matthew Erskine	Msc	Physiology	1998	<i>"MRI and MRS of MS Patients at 4T"</i>
5.	Paula Piraino	PhD	Physiology	2003	<i>"Prolonged anti $\alpha 4$ treatment in EAE"</i> Recipient of OGSST
6.	Lisa Cook	PhD	Physiology	2003	<i>"Advanced MRI Technologies in MS"</i> Recipient of MS Studentship
7.	Shauna Kirk	MSc	Pathology	2002	<i>"Mechanism of action of beta interferon"</i>

Medical Students 4th Year Elective Research

1.	John O'Brien (Oxford)	1989 - 90	<i>"NMR Changes in EAE Precede Clinical and Pathological Events"</i>
2.	Daniel Struk	1992 - 93	<i>"Stability Studies on Chemoembolization Mixtures"</i>

4th Year Project Students

1.	Charlie Younger	1988 - 89	Chemistry (McMaster)	<i>"Volumetric Determination of MS Plaques in MRI"</i>
2.	Tamara Tram	1989 - 90	Electrical Engineering	<i>"Acquiring EEG in High Field MRI"</i>
3.	John Ieraci	1989 - 90	Electrical Engineering	<i>"Digital Filtering for EEG Measurements in MRI"</i>
4.	Tom Stavraky	1990 - 1	Physiology	<i>"Phosphorus NMR Spectroscopy in Epilepsy"</i>
5.	Jeff Granton	1993 - 4	Physiology	<i>"Role of Superoxide in Brain Inflammation"</i>
6.	Roselyn Jeun	1992 - 3	Physiology	<i>"Prazosin Alters Clinical Progress of EAE"</i>
7.	Eni Kesthelyi	1994 - 5	Physiology	<i>"Anti $\alpha 4$ Treatment of Longstanding EAE"</i>
8.	Jennifer Tomlin	1995 - 6	Physiology	<i>"Extending Anti-$\alpha 4$ Therapy Using Tolerization"</i>
9.	Paula Piraino	1996 - 7	Physiology	<i>"Copaxone Treatment of EAE"</i>
10.	Tomas Jimenez	1997 - 8	Physiology	<i>"Cell Trafficking and BBB Disruption"</i>

Radiology Residents, Research Project

1.	Leslie Vandenburg	1992 - 93	<i>"Chemoembolization mixtures" (Winner CAR Resident's Award)</i>
2.	P.S. Olutola	1985 - 86	<i>"Serum effects of radiographic contrast"</i>

Advisory Committees

1.	Chao Zhong	MSc (Pharmacology)	1989 - 1991
2.	Eugene Florio	PhD (Biochemistry)	1989 - 1992
3.	Ross Mitchell	PhD (Biophysics)	1990 - 1996

4.	Andrew Farrall	MSc (Biophysics)	1992 - 1995
5.	Scott Hamilton	PhD (Physiology)	1992 - 1996
6.	Elizabeth Henderson	MSc (Biophysics)	1993 - 1999
7.	Rob Bartha	MSc (Biophysics)	1994 - 1998
8.	Joseph Gati	MSc (Biophysics)	1995 - 1996
9.	Craig Jones	MSc (Biophysics)	1995 - 1997
10.	Constance Campbell	MSc (Biophysics)	1995 - 1997
11.	Chris Thomas	PhD (Biophysics)	1996 - 2000
12.	Jodi Adams	MSc (Physiology)	1997 - 2000
13.	Cheryl McCreary	PhD (Biophysics)	1998 - present
14.	Neil Duggal	MSc (Pathology)	1998 - 2001
15.	Angela Beye	MSc (Physiology)	1998 - present
16.	Eric Jensen	PhD (Biophysics)	1998 - present
17.	Cameron Lush	PhD (Physiology)	1998 - 2001

Post-doctoral Fellows:

1.	Eric Viiree	1992 - 1994	<u>Current Appointment</u> Dept. Of Otolaryngology and Human Interface Technology Laboratory University of Washington, Seattle
2.	Alan Taylor	1989 - 1990	Department of Chemistry University of Victoria, British Columbia
3.	Paula Gareau	1997 - 2000	Scientist, Imaging Laboratory, Roberts Research Institute Winner: Young Investigator Award ISMRM 2000

Thesis Examiner

1.	Wendy Stewardt	PhD	University of British Columbia
2.	Joseph Maglesi	MSc	Biochemistry
3.	Ivan Yeung	PhD	Medical Biophysics
4.	Jeff Stanley	PhD	Medical Biophysics
5.	Cheryl McCreary MSc		Medical Biophysics
6.	Kathy Hamilton	PhD	Biochemistry
7.	Saryu Singh	PhD	Medical Biophysics
8.	Greet Peersman	PhD	Univ. of Antwerp
9.	Ian Callow	MSc	Pharmacology and Toxicology
10.	Raymond Chung	PhD	Physiology
11.	Susan Hochstenbach	PhD	Physiology
12.	Monica Way	MSc	Neuroscience
13.	Ramin Siushansian	PhD	Physiology
14.	John Potwarka	MSc	Medical Biophysics
15.	Cameron Lush	MSc	Physiology
16.	Jonas Vanderznan	MSc	Physiology
17.	Rob Bartha	PhD	Medical Biophysics
18.	Lin Wang	MSc	McGill University
19.	Xi-Zhen Zhu	PhD	Chemistry
20.	Janine Robichaud	MSc	Microbiology and Immunology
21.	L.Foley	PhD	Biochemistry, James Cook University

CONTRIBUTIONS TO TEACHING AND EDUCATION:**Teaching**

1989 - present	Biology 310 Laboratory	Cardiovascular and Respiratory	15 hrs. Laboratory (groups of 8)
1989 - 1998	Dental Physiology (415)	Respiratory System Seminars	8 hrs. Classroom (n=40)
1993 - present	Critical Inquiry	Radiology Residents	8 hrs. Small Group
			24 hrs. Small Group
1990 - present	Physiology 441y	Seminars	4 hrs. Small Group
1998 - 2000	Oral Physiology (Dentistry 115)	Sensory Physiology Seminars	8 hrs. Classroom n=54
			8 hrs. Small Groups

RESEARCH FOCUS:

I am primarily interested in:

- 1) The generation and evaluation of new therapies for multiple sclerosis.
- 2) The molecular basis of altered MRI/MRS in MS.

RESEARCH FUNDING:

<u>Year</u>	<u>Grantor</u>	<u>Investigators</u>	<u>Purpose</u>	<u>Amount</u>
1983	Academic Development, U.W.O.	Karlik	Start up	65,000
1984-85	Banting Foundation	Karlik	MRI Research	18,700
1984-86	PST	Noseworthy Karlik	EAE-NMR Studies	100,000
1987-92	MS Society	Karlik	EAE-MRI Studies	285,000
1987-89	Lederle Laboratories	Karlik Noseworthy	Quantitation of Mitoxantrone treatment in EAE	30,000
1988-91	Upjohn Co.	Karlik	Lipid peroxidase inhibitors in BBB disease	147,000
1989	Upjohn Co.	Noseworthy Karlik	Quantitative MRI in MS	114,512
1986-90	MRC	Fox, Karlik	MRI of Dementia	117,000
1987-90	MRC	Feasby, Fox, Ebers, Karlik	Optic Neuritis	59,149

1988-89 Heart & Stroke	Gelb, Karlik	Drug Treatment in Stroke	52,079
1984-90 University Hospital Pooled Research Fund, University Hospital Foundation	Karlik	Several small Grants (5) for project initiation	61,250
1989-90 MS Society	Karlik, Noseworthy	Quantitative MRI in MS	110,000
1991-94 Upjohn Co.	Karlik	Lazaroid suppression of EAE	90,965
1992-93 Sterling-Winthrop Imaging Research Institute	Karlik	Cine MRI in oculomotor disease	14,423
1992-94 Sterling-Winthrop Imaging Research Institute	Karlik	Career Scientist	80,509
1992-2002 MS Society	Mitchell, Karlik, Lee, Rutt	Automated Detection and Quantification of MS lesions in MRI Images	420,000
1993-94 Mallinckrodt	Karlik	Quantifying Blood-Brain- Barrier Permeability Using MP1177/10	36,400
1994-95 UH Pooled Research Fund	Downey, Karlik	Intervention Chemical Carcinogens	6,500
1994-96 MS Society	Karlik, Rice	An integrin-based therapy for Multiple Sclerosis	210,000
1994-2004 Athena Neurosciences/Elan	Karlik	Cell Adhesion Studies in EAE	521,000
1995-96 MS Society	Hyduk	Studentship (PhD Student)	15,959
1996-97 Teva Pharmaceuticals	Karlik	Evaluation of Cop-1	25,000
1996-97 Biogen, Inc.	Karlik	Anticytokine therapy in MS	21,000
1997-98 MS Society	Karlik, Rice	MRI and MRS at 4T	33,000
1998-2000 MS Society	Gareau	PDF	50,000
1999-2002 OGSST	Piraino	Studentship	45,000
2000-2003 ACR	Karlik, Reinhold, Beam, Blackmore	Fundamentals of Clinical Research for Radiologists	450,000

2000-2001	CAR Foundation	Karlik, Rankin	Cost of Angiography	20,000
2000-2001	MS Society	Cook	Studentship	16,000
2000-2001	Biogen	Karlik	Immunotherapy in MS	20,200
2001-2004	CIHR	Karlik, Hammond	Remyelination in EAE	110,000

PUBLICATIONS:

CHAPTERS IN BOOKS:

1. Crapper, D.R., Karlik, S.J., and DeBoni, U.: Aluminum and Other Metals in Senile (Alzheimer) Dementia. In Katzman, R., Terry, R.D., and Bick, K.L. (Eds.): Alzheimer's Disease: Senile Dementia and Related Disorders. (Aging, Vol 7). Raven Press, New York, 1978, pp. 471-485.
2. Eichhorn, G.L., Shun, Y.A., Clark, P., Rifkind, J., Pitha, J., Tarien, E., Rao, G., Karlik, S.J., and Crapper, D.R.: Essential and Deleterious Effects in the Interaction of Metal Ions with Nucleic Acids. In Kharasch, N. (Ed.): Trace Metals in Health and Disease. Raven Press, New York, 1979, pp. 123-133.
3. Eichhorn, G.L., Butzow, J., Clark, P., von Hahn, H., Rao, G., Heim, J., Tarien, E., Crapper, D., and Karlik, S.J.: Metal Ion-Nucleic Acid Interactions, Aging and Alzheimer's Disease. In Martell, A. (Ed.): Inorganic Chemistry in Biology and Medicine. American Chemical Society, Washington, D.C., 1980, pp. 75-88.
4. Crapper, D.R., Dalton, A.J., Karlik, S.J., and DeBoni, U.: The Role of Aluminum in Alzheimer's Disease. Chapter 2 in Alexander, P.E. (Ed.): Electrolytes and Neuropsychiatric Disorders. Spectrum Publication, Inc., New York, 1981, p.89.
5. Crapper-McLachlan, D.R., Galen, H., Farnell, B., DeBoni, U., Karlik, S.J., and Eichhorn, G.L.: Aluminum in Human Brain Disease. In Sarkar, B. (Ed.): Metal Ions in Health and Disease. Raven Press, New York, 1983, pp. 209-218.
6. Karlik, S.J. Use of NMR Spectroscopy to Measure Intracellular Ion Concentrations, in Methods in Neurosciences. 27:39-51 (1995).

ARTICLES IN REFEREED JOURNALS:

7. Karlik, S.J., Eichhorn, G.L., and Crapper, D.R.: Molecular Interactions of Aluminum with DNA. Neurotoxicology, **1**: 83-88 (1980).
8. Karlik, S.J., Eichhorn, G.L., Lewis, P.N., and Crapper, D.R.: Interactions of Aluminum Species with DNA. Biochemistry, **19**: 5991-5998 (1980).
9. Karlik, S.J., Elgavish, G.A., and Eichhorn, G.L.: ²⁷Al-NMR Studies on Phosphorylated Biological Compounds. J. Mag. Res., **49**: 164 (1982).
10. Karlik, S.J., Elgavish, G.A., and Eichhorn, G.L.: Multinuclear NMR Studies of Aluminum-ATP Equilibria. Journal of the American Chemical Society, **105**: 602-609 (1983).
11. Karlik, S.J., Elgavish, G.A., and Eichhorn, G.L.: ²⁷Al-NMR of Aqueous Aluminum Complexes with Carboxy Ligands. Inorganic Chemistry, **22**: 525-529 (1983).
12. Vinitski, S., Pearson, M., Karlik, S., Morgan, W., Carty, L., Perkins, G., and Goto, T.: Differentiation of Parenchymal

Lung Disorders with in vitro proton NMR, *Mag Res Med* 3, 120 (1986).

13. Karlik, S.J.: Common Pharmaceutical Alter Tissue Proton NMR Properties, *Mag Res Med* 3, 366 (1986).
14. Karlik, S.J., Gilbert, J., Strejan, G.G. and Noseworthy, J.H.: NMR studies in Acute Experimental Encephalomyelitis (EAE). Normalization of T1 and T2 with parenchymal cellular infiltration. *Neurology* 36, 1112 (1986).
15. Olutola, P.S., Hutton, L., Karlik, S. and Henderson, A.R.: The Effect of Ionic Radiographic Contrast Medium on Serum Electrolytes and Proteins during Intravenous Urography. *Amer. J. Roent.* 147: 657 (1986).
16. Fox, A.J., Bogousslavsky, J., Carey, L.S., Barnett, H.J.M., Vinitski, S., Karlik, S.J., Vinuela, F., Pelz, D.M., Hachinski, V.: Magnetic Resonance Imaging of Small Medulla Infarctions. *Amer. J. Neuroradiol.* 7, 229 (1986).
17. Chin, J., Stiller C. and Karlik, S.J.: Nuclear Magnetic Resonance Assessment of Renal Perfusion and Preservation for Transplantation. *J. Urol.* 136, 1351 (1986).
18. Pelz, D.M., Karlik, S.J., Fox, A. and Vinuela, F.: Magnetic Resonance Imaging in Down Syndrome. *Can. J. Neurol. Sci* 13:566 (1986).
19. Karlik, S.J., Fuller, J. and Gelb, A.: Anesthetics Alter Tissue Proton Relaxation. *Acta Radiologica* 369:500 (1986).
20. Eichhorn, G.L., Butzow, J.J., Shin, Y.A., Clark, P., Pitha, J., Pillai, R.P. and Karlik, S.J.: Changes of Biological Significance Induced by Metal Ions in the Structure of Nucleic Acids. *Ann. 1st, Super. Sanita, Vol. 22, N.2* (1986), pp. 663-668.
21. O'Brien, J.T., Noseworthy, J.H., Gilbert, J.J. and Karlik, S.J.: NMR Changes in Experimental Allergic Encephalomyelitis: NMR Changes Precede Clinical and Pathological Events. *Mag. Res. Med.* 5:107 (1987).
22. Karlik, S.J. and Noseworthy, J.H.: Apparatus for Percoll Microgravimetry in Experimental Brain Edema. *Stroke* 18:661 (1987).
23. Grant, C.W.M., Barker, K.R., Florio, E. and Karlik, S.J.: A phospholipid Spin Label used as a Liposome - Associated MRI Contrast Agent. *Mag. Res. Med.* 5, 371 (1987).
24. Noseworthy, J.H., Gilbert, J.J., Vandervoort, M.K. and Karlik, S.J.: Post Natal Changes in Guinea Pig Central Nervous System: Potential Relevance to Experimental Allergic Encephalomyelitis. *Magnetic Resonance in Medicine* 6, 199 (1988).
25. MacLachlan, R., Myles, V. and Karlik, S.J.: Correlation of Proton Relaxometry with Electrical Activity in Experimental Epilepsy. *Epilepsia* 29:396 (1988).
26. Karlik, S.J., Heatherley, T., Pavan, F., Stein, J., Lebron, F., Rutt, B., Carey, L., Wexler, R., and Gelb, A. Patient Anesthesia and Monitoring at a 1.5T MRI Installation. *Mag. Res. Med.* 7, 210 (1988).
27. Karlik, S.J. and Eichhorn, G.L.: Polynucleotide crosslinking by aluminum. *J Inorg Biochem* 37:259-269 (1989).
28. Karlik, S.J., Chang, A.A., Eichhorn, G.L. and DeBoni, U.: Reversible Toroidal Compaction of DNA by Aluminum. *Neurotoxicology* 10:167-176 (1989).
29. Grant, C., Karlik, S.J. and Florio, E. A Liposomal MRI Contrast Agent: Phosphatidylethanolamine-DTPA. *Mag. Res. Med.* 11,236 (1989).
30. Karlik, S.J., Wong, C., Gilbert, J.J. and Noseworthy, J.H.: NMR Studies in the Relapsing Experimental Allergic Encephalomyelitis (EAE) Model of Multiple Sclerosis in the Strain 13 Guinea Pig. *Mag. Res. Imag* 7:463-473 (1989).

31. Karlik, S.J., Gilbert J.J., Wong, C., Vandervoort M.K., Noseworthy, J.H.: NMR Studies in Experimental Allergic Encephalomyelitis (EAE): Factors which Contribute to T1 and T2 Values. *Mag. Res. Med.* 14:1-11 (1990).
32. Noseworthy J.H., Karlik S.J., Wiebe S, Hopkins M, Vandervoort M.K., Hewitt L, Rice G.P.A., Ebers GC. "Active" relapsing and progressive multiple sclerosis patients have similar magnetic resonance behavior: Implications for clinical trial design. *Ann Neurol* 1990; 28:231-2.
33. Lownic S, Wu X, Karlik SJ and Gelb AN. Cerebral Edema after Induced Hypotension: The Effect of Rate of Return Blood Pressure. *Neurosurg.* 27,901-906 (1990).
34. Karlik, S.J., Florio, E., and Grant, C.W.M.: Comparative Evaluation of Two Membrane-based Liposomal MRI Contrast Agents. *Mag. Res. Med.* 19:56-66 (1991).
35. Karlik, S.J., Stavaky, R.T., Taylor, A.W., Fox, A.J. and McLachlan, R.S.: Magnetic Resonance Imaging and ³¹P Spectroscopy of an Interictal Spike Focus in the Rat. *Epilepsia* 32,446-453 (1991).
36. Weinshenker, B., Bass, B., Karlik, S.J., Ebers, G. and Rice, G. An Open Trial of OKT3 in Patients with MS. *Neurology* 41,1047 (1991).
37. Chin, J., Kadhim, S., Garcia, B., Kim, Y.S., McLean, B. and Karlik, S.: Magnetic Resonance Imaging for Detecting and Treatment Monitoring of Orthotopic Murine Bladder Tumor Implants. *Journal of Urology* 145,1297 (1991).
38. Karlik SJ, Stavaky RT, Grand L, Norley C, Lee DH and Noseworthy JH. Repeated gadolinium MRI in acute experimental allergic encephalomyelitis. *Neuroradiology* 33 (Suppl), 131-133 (1991).
39. Karlik SJ, Lee DH and Fox AJ. Hippocampal proton relaxometry in Dementia. *Neuroradiology* 33 (Suppl). 589-591 (1991).
40. Lee D, Simon J, Szumowski J, Feasby T, Karlik S, Fox A. Optic Neuritis and Orbital Lesions: Lipid-Suppressed Chemical Shift MR Imaging. *Radiology* 179:543-546 (1991).
41. Cadera W, Virre E and Karlik S. Cine MRI of Ocular Motility. *J. Paediatric Ophthalmology and Strabismus. Journal of Pediatric Ophthalmology & Strabismus* 29(2)120-122 (1992).
42. Trevithick, J.R., Xiong, H., Lee, S., Shum, D.T., Sanford, S.E., Karlik, S.J., Norley, C., Dilworth, G.R.: Topical Tocopherol Acetate Reduces Post-UVB, Sunburn-Associated Erythema, Edema, and Skin Sensitivity in Hairless Mice. *Archives of Biochemistry and Biophysics* 296(2)575-582(1992).
43. Kadhim S, Chin J, Garcia B, Lala P, Norley C, McLean B, Karlik S. Biological Response Modifiers (BRM) Immunotherapy of Orthotopically Implanted Murine MBT-2 Bladder Tumours: Treatment Response Monitoring by Magnetic Resonance Imaging (MRI). *Canadian Journal of Infectious Diseases.* 3:143B-148B (1992).
44. Wiebe S., Lee D.H., Karlik S.J., Hopkins M., Vandervoort M.K., Wong C.J., Hewitt L., Rice G.P.A., Ebers G.C., Noseworthy J.H.: Serial Cranial and Spinal Cord Magnetic Resonance Imaging in Multiple Sclerosis: Clinical Correlations and Implications for Classification of Disease Course and Clinical Trial Design. *Annals of Neurology* 32:643-650 (1992).
45. Williamson P, Pelz D, Merskey H, Morrison S, Karlik S, Drost D, Carr T, Conlon P: Frontal, Temporal and Striatal Proton Relaxation Times are Different in Schizophrenic Patients and Normal Control Group. *Am J Psychiatry* 149(4)549-551(1992).
46. Mitchell, J.R., Karlik, S.J., Lee, D.H. and Fenster, A. Automated detection and quantification of multiple sclerosis lesions in MR volumes of the brain. *SPIE Vol. 1652, Medical Imaging VI: Image Processing*, 99-106(1992).
47. Hamilton, G.S., Kennedy, T.G., Norley, C.J.D., and Karlik, S.J. Gadolinium - DTPA Enhanced MRI Demonstrates

- Uterine Vascular Changes Associated with Artificially Induced Decidualization and Ovoid Implantation in Rats. *Mag Res Med* 29:817-821(1993).
48. Noseworthy, J.H., Hopkins, M.B., Vandervoort, M.K., Karlik, S.J., Lee, D.H., Penman, M., Rice, G.P.A., Grinwich, K.D., Cauvier, H., Harris, B.J., Ebers, G.C.: An open-trial evaluation of mitoxantrone in the treatment of progressive M.S. *Neurology* 43,1401-1406(1993).
 49. Stavratsky, R.T., Grant, C.W.M., Barber, K.R. and Karlik, S.J. Baseline Consideration of Liposomal Contrast Agent. CNS Transport by Macrophages in Experimental Allergic Encephalomyelitis. *Magnetic Resonance Imaging* 11:685-689(1993).
 50. Karlik, S.J., Grant, E.A., Lee, D., Noseworthy, J.H.: Gadolinium Enhancement in Acute and Chronic- Progressive Experimental Allergic Encephalomyelitis in the Guinea Pig. *Magnetic Resonance in Medicine* 30:326-331(1993).
 51. Bach, D.B., Vellet, A.D., Karlik, S.J., Downey, D.B., Levin, M.F., Munk, P.L. Producing Picture-Perfect Posters. *AJR* 160:1303-1307(1993).
 52. Struk, D., Rankin, R.N and Karlik, S.J. Stability Studies on Chemoembolization Mixtures: Dialysis Studies of Doxorubicin and Lipiodol with Avitene, Gelfoam and Angiostat. *Inves Radiol* 28,1024-1027(1993).
 53. Mitchell, J.R., Karlik, S.J., Lee, D.H. and Fenster A. Multi-spectral analysis and visualization of Multiple Sclerosis lesions in MR volumes of the brain. *SPIE Vol 1898 Medical Imaging VII*, 442-452 (1993).
 54. Bloom, J.N., Cadera, W., Heiberg, E. and Karlik, S.J. A Magnetic Resonance Imaging Study of Horizontal Rectus Muscle Palsies. *J. Pediatric Ophthalmol. and Strabismus* 30:296-300(1993).
 55. Trevithick, J.R., Shum, D.T., Redae, S., Milton, K.P., Norley, C. Karlik, S.J., Groom, A.C. and Schmidt, E.E. Reduction of Sunburn Damage to Skin by Topical Application of Vitamin E Acetate Following Exposure to Ultraviolet B Radiation: Effect of Delaying Application or Reducing Concentration of Vitamin E Acetate Applied. *Scanning Microscopy* 7(4):1269-1281 (1993).
 56. Mitchell, J.R., Karlik, S.J., Lee, D.H. and Fenster A. Computer-assisted Identification and Quantification of Multiple Sclerosis Lesions in MR Imaging Volumes in the Brain. *J. Mag Res Imag* 4:197-208(1994).
 57. Hamilton, G.S., Kennedy, T.G., Karlik, S.J. Early Identification of Sites of Embryo Implantation in Rats by Means of Gadolinium-enhanced MR Imaging. *J. Mag Res Imag* 4:481-484 (1994).
 58. Cadera, W., Karlik, S.J., Viire, E., Bloom, J.N. Ocular Pursuit Movement Assessment by Magnetic Resonance Imaging. *J. Pediatr Ophthalmol Strabismus* 31:265-266 (1994).
 59. Mitchell JR, Karlik S, Lee D, Fenster A. Classification and Analysis of Multiple Sclerosis Lesions in Spin-Echo Exams. *SPIE Visualization in Biomedical Computing* 2359:362-372 (1994).
 60. Kent, S.J., Karlik, S.J., Cannon, C., Hines, D.K., Horner, H.C., Yednock, T.A., Fritz, L.C. A Monoclonal Antibody to $\alpha 4$ Integrin Suppresses and Reverses Active Experimental Allergic Encephalomyelitis. *J Neuroimmunology* 58, 1-10 (1995).
 61. Hyduk, S.J., Karlik, S.J., Rice, G.P.A., Horner, H.C. A Monoclonal Antibody to α -Integrin Reverses the MRI - Detectable Signs of Experimental Allergic Encephalomyelitis in the Guinea Pig. *Journal of Magnetic Resonance Imaging*, *J Mag Res Imaging* 5(5):1-7 (1995).
 62. Mitchell JR, Karlik SJ, Lee DH, Eliasziw M, Rice GPA, Fenster A. The Variability of Manual and Computer Assisted Quantification of Multiple Sclerosis Lesion Volumes. *Medical Physics* 23(1):85-97 (1996).
 63. Mitchell JR, Karlik SJ, Lee DH, Eliasziw M, Rice GPA, Fenster A. Quantification of Multiple Sclerosis Lesion

Volumes in 1.5 T and 0.5 T Anisotropically Filtered and Unfiltered MR Exams. *Medical Physics* 23(1):115-126 (1996).

64. Karlik, S.J., Stavray R.T., C., Hall, E.D. A Reduction of MRI Abnormalities and Clinical Findings Associated with Allergic Encephalomyelitis Produced by the 21-Aminosteroid Tirilazad Mesylate (U74006F). *Multiple Sclerosis*, 1:228-235 (1996).
65. Keszthelyi E, Karlik S, Hyduk S, Rice GPA, Gordon G, Yednock T, Horner H. Evidence for a Prolonged Role of $\alpha 4$ Integrin Throughout Active Experimental Allergic Encephalomyelitis. *Neurology* 47:172-178 (1996).
66. Mitchell JR, Karlik S, Lee D, Eliasziw M, Rice G, Fenster A. Evaluating the Impact on Operator Performance of Quantification Algorithms. *SPIE Med Imaging 1996, Image Processing*, 2710:524-533 (1996).
67. Chin JL, Garcia BM, Kahdim SA, Nickel JC, Batislam E, Morales A, Karlik SJ. Mycobacterium Cell Wall: An Alternative to Intravesical Bacillus Calmette Guerin (BCG) Therapy in Orthotopic Murine Bladder Cancer. *J. Urology* 156 (3):1189-1193 (1996).
68. Mitchell JR, Jones C, Karlik SJ, Lee DH, Rutt BR, Fenster A. Magnetic Resonance Multispectral Analysis of Multiple Sclerosis Lesions. *JMRI* 7(3):499-511 (1997).
69. Caderra, W., Bloom, J.N., Karlik, S.J., Viire, E. A Magnetic Resonance Imaging Study of Double Elevator Palsy. *Can J Ophthalmol* 32(4):250-253 (1997).
70. Kadhim S, Karlik SJ, Chin JL, Garcia B, Batislam E, Skamene E. Genetically Regulated Response to Intravesical Bacillus Calmette Guerin Immunotherapy of Orthotopic Murine Bladder Tumor. *J. Urology* 158 (2):646-652 (1997).
71. Karlik SJ, Hyduk SJ, Rice GPA. Adhesion Molecules: An Integruing Therapeutic Target in MS. *The International MS Journal* 4(2):55-61 (1997).
72. Karlik SJ, Sauerbrei E. Radiology Resident's Research in Canada: Status of Infrastructure. *Can Assoc Radiol J* 1998;49:314-319.
73. Hyduk SJ, Karlik SJ. Apoptotic Cells are present in the CNS throughout Acute and Chronic Progressive EAE in the Absence of Clinical Recovery. *J. Neuropath Exp Neurol* 57(6):602-614 (1998).
74. Karlik SJ, Strejan G, St. Louis J, Munoz D. Correlation Between MRI and Clinico-Pathological Manifestations in Lewis Rats Protected from Experimental Allergic Encephalomyelitis by Acylated Synthetic Peptide of Myelin Basic Protein. *Mag Res Imag* 17(5):731-738 (1999).
75. Moore JA, Rutt BK, Karlik SJ, Yin K, Ethier CR. Computational Blood Flow Modeling Based on In Vivo Measurements. *Annals of Biomedical Engineering* 27:627-640 (1999).
76. Hyduk S, Karlik SJ, Horner H. Temporal Relationship Between CNS Endothelial VCAM-1 Expression, Mononuclear Cell Infiltration, Histology and Clinical Activity in Acute EAE. *Multiple Sclerosis* (submitted).
77. Gareau PJ, Gati JS, Menon RS, Lee D, Rice G, Mitchell JR, Mandelino P, Karki SJ. Reduced Visual Evoked Responses in Multiple Sclerosis Patients with Optic Neuritis: Comparison of Functional Magnetic Resonance Imaging and Visual Evoked Potentials. *Multiple Sclerosis* 5:161-164 (1999).
78. Gareau PJ, Mitchell JR, Bowen CV, Karlik SJ, Rutt BK. In Vivo Measurements of Multi-Component T2 Relaxation Behaviour in Guinea Pig Brains. *Magnetic Resonance Imaging* 17(9):1319-1325 (1999).
79. Mitchell JR, Gareau PJ, Karlik SJ, Rutt BK. Improved Contrast in Multi-Spectral Phase Images Derived from MR Exams of MS Patients. *MICCAI* 10:800-819 (1999).

80. Gareau PJ, Rutt BK, Karlik SJ, Mitchell JR. Magnetization Transfer and Multi-Component T2 Relaxation Measurements with Histopathologic Correlation in an Experimental Model of MS. *JMRI* 11(6):586-595(2000).
81. Beam CA, Blackmore CC, Karlik SJ, Reinhold C. Editors' introduction to the series. *AJR Am J Roentgenol.* 2001 Feb;176(2):323-5
82. Karlik SJ. How to develop and critique a research protocol. *AJR Am J Roentgenol.* 2001 Jun;176(6):1375-80

ABSTRACTS AND PROFESSIONAL PRESENTATIONS:

1. Karlik, S.J., and Crapper D.R.
"Aluminum Interactions with Chromatin: (I) DNA", Clinical Research Society of Toronto, Annual Meeting, 1977.
2. Crapper, D.R., DeBoni, U., and Karlik, S.J.
"Aluminum: A Neurotoxic Factor in Senile (Alzheimer) Dementia". XIIth Canadian Congress of Neurological Sciences, 1977.
3. Karlik, S.J. and Crapper, D.R.
"Neurotoxicity of Aluminum"
XIVth Canadian Congress of Neurological Sciences, 1979.
4. Karlik, S.J., Eichhorn, G.L., Lewis, P.N. and Crapper, D.R.
"Aluminum Interactions with DNA"
XIIth International Congress of Biochemistry, 1979.
5. Eichhorn, G.L., Butzow, J., Clark, P., Rifkind, J., Shin, Y., Pitha, J., Tarien, E., Crapper, D., and Karlik, S.J.
"Metal Ion-Nucleic Acid Interactions, Aging and Alzheimer's Disease", American Chemical Society Annual Meeting, 1979.
6. Karlik, S.J., Eichhorn, G.L. and Crapper, D.R.
"Molecular Interactions of Aluminum with DNA".
32nd Annual Scientific Meeting of the Gerontological Society, 1979.
7. Karlik, S.J., Elgavish, G.A., Tarien, E., and Eichhorn, G.L.
"²⁷Al and ³¹P NMR Studies of Aluminum Complexes in Aqueous Solution", American Chemical Society Annual Meeting, 1980.
8. Karlik, S.J., Clark, P., Elgavish, G.A., and Eichhorn, G.L.
"²⁷Al-NMR Studies on Systems Relevant to Alzheimer's Disease", 33rd Annual Scientific Meeting of the Gerontological Society, 1980.
9. Karlik, S.J., Elgavish, G.A., and Eichhorn, G.L.
"Multinuclear NMR Studies on Aluminum Interactions with Mono-and Poly-nucleotides", *Fed. Proc.* 40, 1730 (1981), American Society of Biological Chemists Annual Meeting, 1981.
10. Karlik, S.J., Elgavish, G.A., Clark, P., and Eichhorn, G.L.
"Multinuclear NMR of Aluminum Complexes of Nucleotides, Phosphate Compounds and Chromatin", *Federation Proc* 41, 1445 (1982), 66th Annual FASEB Meeting, 1982.
11. Karlik, S.J., and Eichhorn, G.L.
"Application of ²⁷Al-NMR to Biological Systems", 65th Canadian Chemical Conference, 1982.
12. Karlik, S.J., and Eichhorn, G.L.
"Crosslinking of Polynucleotides by Aluminum", *Fed. Proc.* 42, 2088 (1983), 67th Annual American Society

of Biological Chemists 1983.

13. Karlik, S.J. and Eichhorn, G.L.
"Multinuclear NMR Investigation of Aqueous Al Complexes", American Chemical Society Annual Meeting, 1983.
14. Karlik, S.J. and Eichhorn, G.L.
"Aluminum - 27 NMR of Aqueous Complexes", International Society of Magnetic Resonance, 1983.
15. Eichhorn, G.L., Butzow, J.J., Shin, Y.A. and Karlik, S.J.
"Some Effects of Metal Ions on the Function of Biological Structures", 1st International Conference on Bioinorganic Chemistry, 1983.
16. Karlik, S.J., and Eichhorn, G.L.
"Biological Applications of ^{27}Al -NMR", Conference on Aluminum Analysis in Biological Materials, 1983.
17. Eichhorn, G.L., and Karlik, S.J.
"Metal Ions, Aging and Alzheimer's Disease", 23rd International Meeting on Coordination Chemistry, 1984.
18. Karlik, S.J., Noseworthy, J., Gilbert, J., St. Louis, J., Strejan, G.
"Nuclear Magnetic Resonance (NMR) Spectroscopy Studies in Experimental Allergic Encephalomyelitis (EAE)". 3rd Annual Meeting of Society of Magnetic Resonance in Medicine, New York, Meeting abstracts p.399-400. August 1984.
19. Vinitzki, S., Pearson, M.G., Karlik, S.J., Morgan, W.K.C., Carey, L.S., Perkins, G., Goto, T.
"Differentiation of Parenchymal Lung Disorders with the Proton NMR In Vitro". 3rd Annual Meeting of Society of Magnetic Resonance in Medicine, 1984.
20. Noseworthy, J.N., Strejan, G., Gilbert, J. and Karlik, S.
"Comparison of NMR Properties and Histopathology in Experimental Allergic Encephalomyelitis". Neurology 35 (Suppl), 259 (1985), Annual Meeting, American College of Neurology, 1985.
21. Karlik, S.J.
"Alteration in Tissue Proton NMR Properties Produced By Common Pharmaceuticals". Canadian Association of Radiologists. Annual Meeting, 1985.
22. Fox, A.J., Bogousslavsky, J., Carey, L.S., Vinitzki, S., Karlik, S.J., Hachinski, V., and Barnett H.J.M.
"MRI of Small Vertebrobasilar Infarctions". Canadian Association of Radiologists. Annual Meeting, 1985.
23. Karlik, S.J.
"Altered Tissue Proton Relaxation Rates Produced by Chronic Drug Treatment". Radiology 157, 321 (1985). RSNA 1985.
24. Karlik, S.J., Gilbert, J.J. and Noseworthy, J.H.
"Proton Relaxation Time Changes in Myelin-Basic-Protein-Induced Acute Experimental Allergic Encephalomyelitis (EAE). Society of Magnetic Resonance, 4th Annual Meeting. Meeting abstract pages 68-69, August 1985.
25. Eichhorn, G.L., Chuknayski, P., Rifkind, J., Shin, Y.A., Butzow, J.J., Pillai, R.P., Clark, P. and Karlik, S.J.
"Metal Ions and Genetic Information Transfer", XXIV International Conference on Coordination Chemistry, 1986.
26. Karlik, S.J., Pelz, D., and Fox, A.
"MRI of Organic Dementias", International Symposium on Organic Dementia, 1986.

27. Fuller, J., Gelb, A., and Karlik, S.J.
"Anesthetics and Sedatives Alter Tissue Proton NMR Relaxation Properties", *Anesthesia Analgesia* 65, 556 (1986), International Anesthesia Research Soc., 1986.
28. McLachlan, R.S., Myles, V.J. and Karlik, S.J.
"Nuclear Magnetic Resonance Spectroscopy in an Experimental Model of Epilepsy", XXI Canadian Congress of Neurological Sciences, 1986.
29. Noseworthy, J.H., O'Brien, J.T., Gilbert, J.J. and Karlik, S.J.
"Nuclear Magnetic Resonance (NMR) Changes in Experimental Allergic Encephalomyelitis (EAE) Precede Clinical and Pathological Events", XXI Canadian Congress of Neurological Sciences, 1986.
30. Karlik, S.J., Fuller, J., Lok, P., Johnson, U., and Gelb, A.
"Anesthetics Change Tissue Proton Relaxation", XIII Symposium Neuroradiologicum, 1986. *Acta Radiologica, Supp.* 369:500, 1986.
31. Karlik, S.J., O'Brien, J.T., Gilbert, J.J. and Noseworthy, J.H.
"Use of Paramagnetic Contrast Agents in NMR Studies in Experimental Allergic Encephalomyelitis", XII Symposium Neuroradiologicum, 1986. *Acta Radiologica, Supp.* 369:768 (a) 1986.
32. Fuller, J., Gelb, A.W. and Karlik, S.J.
"The Influence of a Halothane and Innovar on Brain Edema Formation", Canadian Anesthetists Society, 1986. *Canadian Anesthetist's Society J.* 33, 5110 (1986).
33. Karlik, S.J. and Avnuch L.
"MR Effects of Ionic and Non-Ionic Radiographic Media"
Radiology 161 (P) 315 (1986). RSNA 1986.
34. Grant, C.W., Barker, K.R. and Karlik, S.J.
"Tempo-phosphatidylcholine: A Liposome - Delivered MR Contrast Agent", *Radiology* 161 (P) 314 (1986). RSNA 1986.
35. Karlik, S.J.
"Alzheimer's Disease: an Inorganic Dementia",
National Institutes of Health. National Institute on Aging, Special Conference, 1986.
36. Karlik, S.J., O'Brien, J.T., Gilbert, J.J. and Noseworthy, J.H.
"Use of Gadolinium Contrast in NMR Studies of Prepathological Events in Experimental Allergic Encephalomyelitis". V. Society of Magnetic Resonance in Medicine p. 1548-9, 1986.
37. Karlik, S.J., Heatherley, T., Pavan, F., Stein, J., Lebron, F., Wexler, R., Carey, L.S.
"Patient Monitoring and Anesthesia at High Magnetic Field (1.5T)". *Proceedings of the 50th Canadian Association of Radiologists.* p.167, 1987.
38. Eichhorn, G.L., Karlik, S.J., Elgavish, G.A. and Pillai, R.
"The Use of NMR in the Study of Aluminum Speciation in Complexes of Biological Importance". American Chemical Society, 1987.
39. Rutt, B.K. and Karlik, S.J.
"Exercised - Induced Changes in MRI Images". *Proceedings of the 29th Meeting of the American Association of Physicists in Medicine*, 1987.
40. Rutt, B., Karlik, S., Munro, T., Vellet, D. and Carey, L.
"Exercise - Induced Changes in T1, T2 and N(H) of Human Leg Muscle". 6th Annual Meeting Society of Magnetic Resonance in Medicine (SMRM), 1987.

41. Karlik, S.J., Gilbert, J.J. and Noseworthy, J.H.
"NMR Studies in Experimental Allergic Encephalomyelitis: In Vitro and In Vivo MR in the Chronic Progressive Model". 6th Annual Meeting Society of Magnetic Resonance in Medicine (SMRM), 1987.
42. Karlik, S.J., Gilbert, J.H. and Noseworthy, J.H.
"Post Natal Changes in Guinea Pig NMR Properties: Potential Relevance to EAE". 6th Annual Meeting Society of Magnetic Resonance in Medicine (SMRM) 80;1987.
43. Grant, C., Barber, K., Florio, E. and Karlik, S.
"In Vivo Investigation of a Liposomal MRI Contrast Agent: Phospholipid Spin Labels". 6th Annual Meeting Society of Magnetic Resonance in Medicine (SMRM), 1987.
44. Karlik, S.J., Rutt, B.K., Heatherley, T., Lebron, F., Pavan, F., Stein, J. and Carey, L.
"Patient Anesthesia and Monitoring at 1.5 Tesla". 6th Annual Meeting Society of Magnetic Resonance in Medicine (SMRM), 1987.
45. Feasby, T., Ebers, G.C., Fox, A.J. and Karlik, S.
"Predictive Tests in Isolated Optic Neuritis". Canadian J. Neurol Sci 14, 241 (1987).
46. Noseworthy, J.H., Gilbert, J.J. and Karlik, S.J.
"Magnetic Resonance Imaging Studies of Experimental Allergic Encephalomyelitis". Canadian J. Neurol Sci 14, 241 (1987).
47. Noseworthy, J.H., Gilbert, J.J. and Karlik, S.J.
"Age - Dependant Changes in NMR Relaxation Times in Guinea Pig Central Nervous System". Can. J. Neurol Sci 14, 242 (1987).
48. Karlik, S.J., Gilbert, J.J. and Noseworthy, J.H.
"NMR Studies of CNS and MBP Induced Acute EAE in the Hartley Guinea Pig". Canadian J. Neurol Sci 13(4):376 (1986). Neuroimmunology Satellite Symposium of Vth International Congress of Immunology.
49. Karlik, S.J., Gilbert, J.J. and Noseworthy, J.H.
NMR Studies in Experimental Allergic Encephalomyelitis (EAE): Chronic Progressive Disease in the Guinea Pig". Proceedings of the 6th Annual Meeting of the Society of Magnetic Resonance Imaging 539, 1988.
50. Karlik, S.J., Fox, A.J. and Lee, D.H.
"Altered Hippocampal Relaxation Times in Dementia". Proceedings of the 6th Annual Meeting of the Society of Magnetic Resonance Imaging, 539, 1988.
51. Noseworthy, J.H., Gilbert, J.J. and Karlik, S.J.
"NMR Studies in Experimental Allergic Encephalomyelitis: Quantitative MRI of CNS - Induced Disease in Adult Hartley Guinea Pigs". Neurology 38 (Suppl) 254 (1988).
52. Noseworthy, J.H., Gilbert, J.J. and Vandervoort, M.K., Wong, C. and Karlik, S.J.
"NMR Studies in Experimental Allergic Encephalomyelitis: Factors which contribute to T1 and T2 values". Neurology 38 (Suppl), 217 (1988).
53. Lownie, S., Wu, X., Karlik, S.J. and Gelb, A.
"Cerebral Edema after Induced Hypotension: An MR and Evans Blue Study". Proceedings of 7th International Symposium of Intracranial Pressure and Brain Injury, 1988.
54. Gelb, A., Wu, X., Karlik, S.J. and Lownie, S.
"Cerebral Edema after Induced Hypotension: The Effects of Rate of Return of Blood Pressure". American Society of Anesthesiologists, 1988.

55. Karlik, S.J., Grant, C. and Florio, E.
"Liposomal MRI Contrast Agent: Phosphatidylcholine". Society of Magnetic Resonance Imaging. 7th Annual Meeting, 1988.
56. Rutt, B., Karlik, S.J., Nott, L., Amandola, N.
"Exercise-Induced Changes in Magnetic Resonance Images." *Proceeding of Sport Med.* 1988.
57. Viire, E.S., Karlik, S.J., Vilis, T.
"Extraocular Muscle Rotation Axes: Determination in The Intact Human by Magnetic Resonance Imaging." *Society for Neuroscience*, 1988.
58. Noseworthy, J.H., Lee, D., Neil, M., Gilbert, J.J. and Karlik, S.J.
"Serial MRI Studies of Mitoxantrone-Treated Animals with Acute and Chronic Experimental Allergic Encephalomyelitis." *March 1989 Neurology* 39 (Suppl 1) 113.
59. Karlik, S.J., Wong, C., Gilbert, J.J., Noseworthy, J.H.
"NMR Studies in the Relapsing Remitting Model of EAE." 7th Annual Meeting, Society of Magnetic Resonance Imaging, 1989; 7 (Suppl. 1):22.
60. Karlik, S.J., Stavsky, R.T., Fox, A.J. and MacLachlan, R.
"A ¹H-MRI and ³¹P-MRS Study of Penicillin-Induced Focal Epilepsy." *Society of Magnetic Resonance in Medicine*, Eighth Annual Meeting, 1989.
61. Karlik, S.J., Florio, E., Grant and C.W.M.
"In Vivo Comparison of Two Membrane-based Liposomal MRI Contrast Agents." *Society of Magnetic Resonance in Medicine*, Eighth Annual Meeting, 1989.
62. Karlik, S.J., Gilbert, J.J., Lee, D. H. and Noseworthy, J.H.
"In Vivo ¹H MRI and Relaxometry in the Relapsing Remitting Model of Experimental Allergic Encephalomyelitis in the Strain 13 Guinea Pig." *Society of Magnetic Resonance in Medicine*, Eighth Annual Meeting, 1989.
63. Karlik, S.J., Lowney, S. and Gelb, A.W.
"Correlation of Altered MRI and Evans Blue Extravasation in Retractor-Induced Brain Injury." *Society of Magnetic Resonance in Medicine*, Eighth Annual Meeting, 1989.
64. MacLachlan, R.S., Stavsky, R.T., Karlik, S.J. and Fox, A.J.
"Magnetic Resonance Imaging and ³¹P-Spectroscopy of Interictal Penicillin Foci in Rats." 1989 American Epilepsy Society.
65. Karlik, S.J., Lee, D.H., Fox, A.J., Noseworthy, J., Ebers, G., Szumowski, J., Simon, J.
"Water-Suppressed MR Fails to Detect Lipid in MS Lesions". *American Society of Neuroradiology, Annual Meeting*, 1989. *AJNR*: 10; 901, 1989.
66. Lee, D.H., Simon, J., Szumowski, J., Fox, A.J., Pelz, D., Karlik, S.J.
"Fat Suppressed MR Imaging of Orbital and Optic Nerve Lesions". *Seventh Annual Meeting, SMRI*, 1989.
67. Karlik, S.J., Wong, C., Gilbert, J.J. and Noseworthy, J.H.
"NMR Studies in the Relapsing-Reiniting Model of EAE". *Seventh Annual Meeting, SMRI*, 1989.
68. MacLachlan, R.S., Stavsky, R.T., Karlik, S.J. and Fox, A.J.
"Magnetic Resonance Imaging and ³¹P-Spectroscopy of Interictal Penicillin Foci in Rats". *American Epilepsy Society*, 1989.
69. Karlik, S.J., Lee, D., Vandervoort, M., Hopkins, M., and Noseworthy, J.

"Serial Quantitative Brain MRI in Multiple Sclerosis using Visual and Volumetric Techniques". American Academy of Neurology, Neurology 40 (suppl 1):142, 1990.

70. Lownie, S., Fox, A.J., Karlik, S. and Gelb, A.
"MRI of Retractor - Induced Brain Injury". American Society of Neuroradiology, 1990.
71. Wiebe, S., Karlik, S.J., Lee, D.H., Hopkins, M., Vandervoort, M.K., Ebers, G., Rice, G. and Noseworthy, J.
"Clinical - MRI Correlations in Multiple Sclerosis: A Serial Study Using Quantitative Cranial and Spinal MRI". XXV Canadian Congress of Neurological Sciences, 1990, Can J Neurol Sci 1990; 17:241.
72. Noseworthy, J.H., Lee, D.H., Hopkins, M., Vandervoort, M.K., Wiebe, S., Ebers, G., Rice, G. and Karlik, S.J.
"Similarity of MRI Behaviour in "Active" Relapsing and Progressive Multiple Sclerosis: Results of a Serial Clinical - MRI Study". XXV Canadian Congress of Neurological Sciences, Canadian Journal of Neurol. Sci., 1990, 17:282.
73. Karlik, S.J., and Fox, A.J.
"MRI in Dementia". XIV Symposium Neuroradiologicum, Neuroradiology, 1990.
74. Karlik, S.J. and Noseworthy, J.H.
"Gadolinium Enhancement in Experimental Allergic Encephalomyelitis (EAE)". XIV Symposium Neuroradiologicum, Neuroradiology, 1990.
75. Karlik, S.J., Rylett, R.J., Leung, G., Munoz, D. and Fox, A.J.
"MRI, Neuropathological and Neurochemical Effects of Nucleus Basalis Lesions in the Rat". Society of Magnetic Resonance in Medicine, 9th Annual Meeting, New York, 1990, 657.
76. Noseworthy, J.H., Karlik, S.J., Wiebe, S., Hopkins, M.B., Vandervoort, M.K., Hewitt, L., Rice, G.P.A., Ebers, G. and Lee, D.H.
"Active Relapsing and Progressive MS Patients have Similar MRI Behaviour. Implications for Clinical Trials Design". American Neurological Association, 1990.
77. Gilbert, J.J., Karlik, S.J., Lee, D.H. and Noseworthy, J.H.
"Correlation of in vivo ¹H MRI, Relaxometry and Pathology in the Relapsing Remitting Model of EAE in the Strain 13 Guinea Pig". XI International Congress of Neuropathology, 1990.
78. Chin, J., Kadhim, S., Garcia, B., Kim, Y.S., McLean, B. and Karlik, S.
"Magnetic Resonance Imaging for Detecting and Treatment Monitoring of Orthotopic Murine Bladder Tumor Implants". American Urological Association Annual Meeting, 1990.
79. Kadhim, S., Chin, J.L., Garcia, B., McLean, B. and Karlik, S.J.
"Magnetic Resonance Imaging (MRI) for Detection and Monitoring of Orthotopically Implanted Murine MBT-2 Bladder Tumors. Annual Meeting, Canadian Urological Association, 1990.
80. Noseworthy, J.H., Lee, D., Penman, M., Hopkins, M., Vandervoort, M.K., Karlik, S.J., Rice, G.P.A. and Ebers, G.C.
"A Phase II Evaluation of Mitoxantrone in the Treatment of Progressive Multiple Sclerosis. AAN Scientific Program, 1991.
81. Vellet D., Levin M., Karlik S., Grant C., and Harris R.
"Prospective Evaluation of Liposomal Gadolinium and Iron Dextran as MR Contrast Agents in a Metastatic Embryonal Cell Liver tumor Mouse Model. Canadian Association of Radiologists Annual Meeting, Hamilton, June 1991.
82. Karlik, S.J., Kadhim, S., McLean, B. and Chin, J.
"Detection and Treatment Monitoring of Orthotopic Murine Bladder Tumor Implants by MRI. Tenth Annual

Meeting, Society of Magnetic Resonance in Medicine, San Francisco, CA, August 1991.

83. Karlik, S.J., Grant, E., Norley, C and Hall, E.
Reduction of MRI Abnormalities and Clinical Findings of Experimental Allergic Encephalomyelitis Produced by the 21-Aminosteroid U74006F. Tenth Annual Meeting, Society of Magnetic Resonance in Medicine, San Francisco, CA, August 1991.
84. Stavratsky, R.T. and Karlik, S.J.
Effect of Steroid Treatment on Clinical and MRI Course of Experimental Allergic Encephalomyelitis. Tenth Annual Meeting, Society of Magnetic Resonance in Medicine, San Francisco, CA, August 1991.
85. Karlik, S.J., Grant, E., Norley, C. and Hall, E.D.
Attenuation of Experimental Allergic Encephalomyelitis (EAE) By The 21-Aminosteroid Tirilazad Mesylate (U74006F). Society for Neuroscience 1991.
86. Stavratsky, R.T. and Karlik, S.J.
An Attempt to Label Macrophages in EAE with Gd/Eu Phosphatidyl-DTPA. Society of Magnetic Resonance in Medicine, Berlin, Germany, August 1992.
87. Hamilton, G.S., Norley, C.J.D., Kennedy, T.G. and Karlik, S.J. Gd-DTPA Enhanced MRI Demonstrates Localized Vascular Permeability Changes in Rat Uteri. Society of Magnetic Resonance in Medicine, Berlin, Germany, August 1992.
88. Karlik, S.J., Virree, E., Davis, J., Munk, P. and Cadera, W.
Dynamic MRI and Ocular Motility. Society of Magnetic Resonance in Medicine, Berlin, Germany, August 1992.
89. Mitchell, J.R., Karlik, S.J., Lee, D.H. and Fenster, A.
Automated detection and quantification of multiple sclerosis lesions in MR volumes of the brain. Society of Magnetic Resonance in Medicine, Berlin, Germany, August 1992.
90. Noseworthy, J.H., Lee, D., Penman, M., Hopkins, M., Vandervoort, M.K., Karlik, S., Rice, G.P.A., Grinwich, K.D., Ebers, G.C.
A Phase II Evaluation of Mitoxantrone HCl in the Treatment of Progressive Multiple Sclerosis. Neurology 41,146 March 1991.
91. Cadera, W. and Karlik, S.J.
Ocular Pursuit Movement Assessment by MRI. American Association for Paediatric Ophthalmology and Strabismus, 1993 Annual Meeting.
92. Karlik, S.J., Virree, E., Cadera, W., Lee, D., Bloom, J.N. and Heiberg, E.
Cine MR Imaging of the Orbit. Radiological Society of North America, 1992. Radiology 185(P), 154 (1992).
93. Mitchell, J.R., Karlik, S.J., Lee, D.H., and Fenster A.
Visualization and Quantification of 3D Changes over time of Multiple Sclerosis as Shown on MR Images of the Brain. Radiological Society of North America, 1992, Radiology 195(P), 398 (1992).
94. Vellut, A.D., Levin, M.F., Karlik, S.J., Grant, C., Harris, R., Munk, P.L.
"Prospective Evaluation of Liposomal Gadolinium and Iron Dextran as MR Contrast Agents in a Metastatic Embryonal Ccl Liver Tumor Mouse Model". Proceedings of the American Roentgen Ray Society Annual Meeting, p.80, 1992.
95. Karlik, S.J., Mitchell J.R., Lee, D.H., and Fenster, A.
Computer Assisted Determination of Multiple Sclerosis Lesions in Magnetic Resonance Images. The Canadian Journal of Neurological Sciences, Suppl. 2-S10, 1993.

96. Jeun, R. and Karlik, S.J.
Prazosin improves MRI findings in Acute Experimental Autoimmune Encephalomyelitis. Society of Magnetic Resonance in Medicine. Abs. from Annual Meeting 1602, 1993.
97. Karlik, S.J., Troup, C., Henderson, E., Lee, T., Lee, D., Del Maestro, R.
Contrast enhanced MRI Studies of experimental cerebral tumors using MP1177/10 injection. Canadian Association of Radiologists Annual Meeting, Toronto, ON. 1994.
98. Karlik, S.J., Kent, S.J., Cannon, C., Hines, D.K., Horner, H.C. and Yednock, T.A.
A Monoclonal Antibody to $\alpha 4$ Integrin Suppresses and Reverses Active Encephalomyelitis. IBC's Third Annual Targeting Cell Adhesion Molecules for Therapeutic Application Meeting, the Ritz-Carlton, San Francisco, May 18 & 19, 1994.
99. Henderson, E., Lee, T.Y., and Karlik, S.J.
An in vivo Method for the Measurement of the Blood Brain Transfer Constant of Gadolinium in Rabbit Brain Tumours Using Clinical MRI. Abs. From the Society of Magnetic Resonance Second Annual Meeting, San Francisco, California, p. 178, August 6 - 12, 1994.
100. Kent, S.J., Karlik, S.J., Yednock, T.A., and Horner H.
A Monoclonal Antibody to $\alpha 4$ Integrin Reverses the MRI-Detectable Signs of Experimental Allergic Encephalomyelitis in the Guinea Pig. Abs. from the Society of Magnetic Resonance Second Annual Meeting, San Francisco, California, p. 249, August 6 - 12, 1994.
101. Kent, S.J., Karlik, S.J., Yednock, T.A., and Horner H.
Reversal of the Clinical Histological and MRI - Detectable Signs of Experimental Allergic Encephalomyelitis by a Monoclonal Antibody to $\alpha 4$ Integrin. Abs. From Society for Neuroscience, 176.12, page 416, 1994, 24th Annual Meeting, Miami Beach, Florida, November 13 - 18, 1994.
102. Karlik, S.J., Hyduk, S.J., Rice, G.P.A. and Horner, H.
A Monoclonal Antibody to $\alpha 4$ Integrin Reverses the Clinical, Histological and MRI-detectable Signs of Experimental Allergic Encephalomyelitis in the Guinea Pig. Canadian Congress of Neurological Sciences 30th Meeting, 1995. Can. J. Neurol. Sci. 22 (51) 542, 1995.
103. Karlik, S.J., Mitchell, J.R., Lee, D.H., Eliasziw, M., Rice, G.P.A., and Fenster, A.
The Variability of Multiple Sclerosis Lesion Quantification. Canadian Congress of Neurological Sciences 30th Meeting, 1995. Can. J. Neurol. Sci. 22 (51) 525, 1995.
104. Karlik, S.J., Keszthelyi, E.J., and Horner H.
Anti $\alpha 4$ Treatment Reverses Active EAE 28 Days Following Disease Appearance. Society for Neuroscience 25th Annual Meeting, 1995.
105. Kent, S.J., Karlik, S.J., and Horner, H.
Lymphocytes Expression of VLA-4 and Infiltration of the Guinea Pig Central Nervous System During Acute Experimental Allergic Encephalomyelitis. Society for Neuroscience 25th Annual Meeting, 1995.
106. Hyduk SJ, Horner H and Karlik SJ.
Apoptotic Cells in the CNS During the Chronic Phase of Actively-Induced EAE: Evidence for Continual Immune Cell Migration. Society of Neuroscience 20th Annual Meeting, 1996.
107. Karlik SJ, Hyduk S, Horner H.
Apoptosis Throughout Chronic EAE.
America's Committee for Treatment and Research in Multiple Sclerosis, Miami, 1996.
108. Karlik S, Holdsworth D, Fenster A, Fox A, Rankin R.

3D Imaging of Vascular Structures. Asian-Pacific Congress on Vascular Disease, 1996.

109. Sauerbrei E, Karlik SJ.
Current State of Radiology Resident's Research in Canada. Canadian Association of Radiologists, 1996.
110. Mitchell, J.R., Jones, C., Karlik, S.J., Kennedy, K., Lee, D.H., Rutt, B.K., and Fenster A.
Multispectral Analysis of Multiple Sclerosis Lesions. Proceedings of the Fifth Scientific Meeting and Exhibition, ISMRM, 652, 1997.
111. Erskine, M.K., Karlik, S.J., and Menon R.S.
In Vitro Correlated Spectroscopy on a 4 Tesla MRI Scanner.
1997 International Symposium, Magnetic Fields: Recent Advances in Diagnosis and Therapy. The Lawson Research Institute, London, Ontario, November 14 - 16, 1997.
112. Gareau, P.J., Jones, C., Bowen, C., Mitchell R., Karlik, S., Rutt, B.
Optimization of Crusher Gradients in a CPMG Imaging Sequence for High Field In Vivo Multicomponent Transverse Relaxation Studies.
1997 International Symposium, Magnetic Fields: Recent Advances in Diagnosis and Therapy. The Lawson Research Institute, London, Ontario, November 14 - 16, 1997.
113. Gareau, P., Mitchell, J.R., Karlik, S.J., and Rutt, B.K.
In Vivo Multi-Component T2 Relaxation of Normal Guinea Pig Brain at 1.5T and 4.0T. ISMRM., 1998, 1339.
114. Gareau, P., Mitchell, J.R., Karlik, S.J., and Rutt, B.K.
Multi-Component T2 Analysis Using CPMG at 4.0 Tesla. ISMRM, 1998, 1340.
115. Karlik SJ.
Comparison of 1.5T and 4T MRI Exams of Patients with Multiple Sclerosis. 123rd Annual Meeting of The American Neurological Association, October 18-21, 1998.
116. Karlik SJ.
In Vivo Multi-Component T2 Relaxation in Normal Guinea Pig Brain at 1.5 and 4.0 Tesla. 123rd Annual Meeting of The American Neurological Association, October 18-21, 1998.
117. Karlik SJ.
Apoptotic Cells are Present in the CNS Throughout Chronic Progressive EAE in the Absence of Clinical Recovery. International Society of Neuroimmunology - Fifth International Congress, August 23-27, 1998.
118. Karlik SJ, Gareau P, Rutt B, Hammond R and Mitchell R.
Pathological Changes Underlying Decreased Magnetization Transfer Measurements.
ECTRIMS/ACTRIMS. 1999.
119. Karlik SJ, Erskine M, Bartha R and Rice GPA.
Abnormalities in Normal Appearing White Matter in MS: A 4T Proton Spectroscopy Study.
ECTRIMS/ACTRIMS, 1999.
120. Gareau P, Rutt BK, Mitchell JR and Karlik SJ.
Magnetization Transfer Measurements in NAWM with Histopathologic Correlation in an Experimental Model of Multiple Sclerosis.
International Society of Magnetic Resonance in Medicine, 1999.
"Young Investigator Award"
121. Karlik SJ, Piraino P, Freedman SB, Messersmith EK, Pleiss MA, Thorsett, ED, Yednock TA.
Prolonged treatment of chronic EAE using an inhibitor of alpha 4 integrin.

ECTRIMS, 2000: Revue Neurologique Supp 3, 3S69.

122. Karlik, S.J., Piraino, P.S., Freedman, S.B., Messersmith, E.K., Pleiss, M.A., Thorsett, E.D. and Yednock, T.A. Sustained reversal of chronic EAE using a small molecule inhibitor of $\alpha 4$ integrin. Symposium on Conquering MS: Research in Canada, 2000
123. P.S. Piraino, T.A. Yednock, S.B. Freedman, E.K. Messersmith, M.A. Pleiss, E.D. Thorsett, and S.J. Karlik. Prolonged Reversal of Chronic EAE using an Inhibitor of $\alpha 4$ Integrin. Society for Neuroscience Abs. 5297, 2000
124. Lisa L. Cook, Paula J. Gareau, J. Ross Mitchell, Stephen J. Karlik. Myelin-Selective MR Imaging of the Guinea Pig Spinal Cord. Symposium on Conquering MS: Research in Canada, 2000

OTHER:

1. Vinitiski, S., Prost, R.W., Hayes, C., Karlik, S.J.: High Resolution Animal Imaging Utilizing Whole Body MRI: Technical Report, General Electric Co. (1988).
2. Karlik, S.J. Radiology Research: A Cornucopia. (Editorial) Can Assoc Radiol J 45(3):177-179 (1994).
3. Karlik, S.J. Critical Inquiry Initiative. CARJ Forum. June (1999).

INVITED ADDRESSES:

1. "Aluminum, Aging and Alzheimer's Disease", University of Manitoba, February 1982.
2. "Multinuclear NMR on Systems Relevant to Alzheimer's Disease", Pennsylvania State University, May 1992.
3. "NMR Studies in Alzheimer's Disease", McGill University, June 1982.
4. "Multinuclear NMR Studies on Aqueous Aluminum Complexes", Smith Kline French Laboratories, June 1982.
5. "Aluminum, Phosphorus and Proton NMR Spectroscopy on Aqueous Aluminum Complexes", Guelph University, July 1982.
6. "Biological Applications of Multinuclear NMR Spectroscopy", University of Western Ontario, July 1983.
7. "Aluminum in Alzheimer's Disease", Johns Hopkins University, July 1983.
8. "Nuclear Magnetic Resonance Imaging Applications", Symposium, University of Western Ontario, March 1984.
9. "Factors Affecting NMR Imaging", National Institute of Health, June 1984.
10. "Factors Affecting MMR Properties of Tissues", National Institutes of Health, May 1985.
11. "Alterations in Tissue NMR Properties", Symposium, St. Joseph's Hospital Research Institute, London, May 1985.
12. "NMR Studies in Alzheimer's Disease", International Symposium on Organic Dementia, London 1986.
13. "Aluminum and Alzheimer's Disease", National Institutes of Health, Trace Metals, Aging and Alzheimer's Disease, Bethesda 1986.
14. Session Chairman, "Fast Imaging, Clinical". 6th SMRI, Boston, Mass, 1988.
15. "In Vivo Proton T1 and T2 Measurements and Radiological Assessment of MRI Scans in Dementia", Alzheimer's Disease Center of Oregon: New Insights into Aging and Dementia: Imaging Brain Structure and Function, 1989.
16. "MRI Studies in an Animal Model of Alzheimer's Disease". National Institutes of Health, 1990.
17. Grantmanship Lecture, Canadian Association of Radiologists, Annual Meeting, 1991.
18. Grantmanship Course, Canadian Association of Radiologists, Annual Meeting, 1992.
19. "MRI Studies in EAE". Neurology National Hospital, Queen's Square, London, England, 1992.
20. "Radiology Research: A Cornucopia", Canadian Association of Radiologists, Annual Meeting 1993.
21. Grantmanship Workshop, McMaster University, 1991.
22. Grantmanship Workshop, University of Montreal, 1991.
23. "MRI: Some Practical Considerations", Annual Meeting, Radiology Managers of Ontario, 1995.
24. "Quantitating Lesions in MRI of MS", University of Auckland, New Zealand, 1996.
25. "Anti-Adhesion Therapy in MS", University of Auckland, New Zealand, 1996.

26. "3D Imaging of Vascular Structures", Asian-Pacific Meeting on Vascular Diseases, 1996.
27. "Imaging Brain Function and Dysfunction", 2nd Korea - U.S. Joint Workshop on Brain Science, KAIST, Taejeon, Korea, January 2000.
28. "New Techniques in Brain Imaging", University, Seoul Korea, January 2000.
29. "Imaging Brain Function and Dysfunction", Seoul National University, Seoul Korea, January 2000.
30. "Imaging Brain Function and Dysfunction", Kingston, Ontario, May 2000.
31. "New MRI Findings in Multiple Sclerosis", TEVA Symposium, July 2000
32. "Development of Antegren", Biogen Symposium, August 2001
33. "Evaluation of the Animal Models of MS", Elan Scientific Advisory Board, Sept 2001
34. "Evaluation of the new McDonald Criteria for the Diagnosis of MS" and "Results of Sequential Studies of MRI and MRS in MS", le troisieme preceptorat sur la SEP, 2001

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